



# **Aircraft Accidents / Incidents: Extending the Vulnerability Database**



## ***ADPA / NSIA Enhancing Aircraft Survivability***

**A Vulnerability Perspective**

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21-23 October 1997**

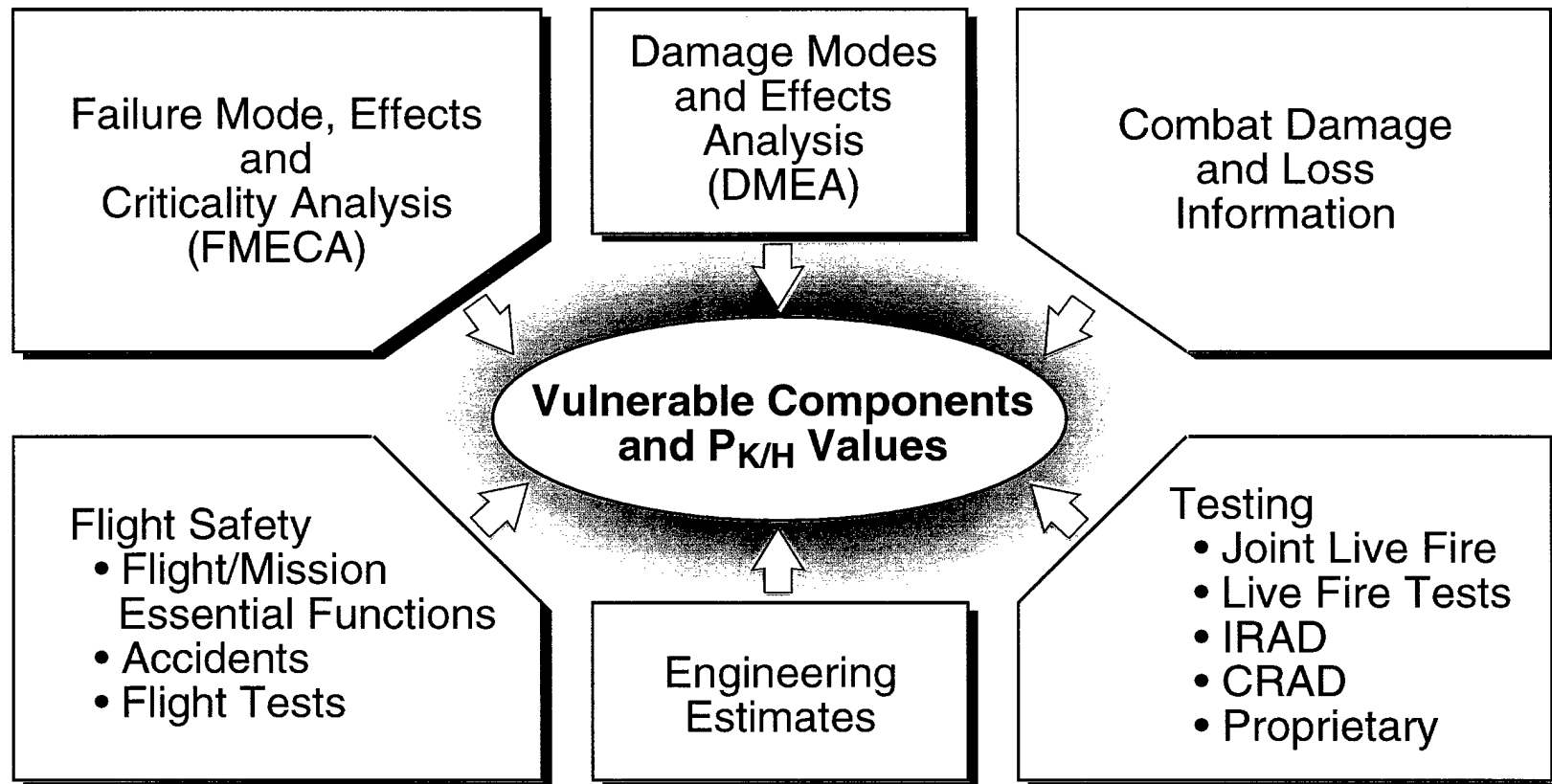
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# Vulnerability Program Elements

- Aircraft Configuration Requirements
- FMECA
- Flight/Mission Essential Functions
- Damage Modes and Effects Analysis
- Vulnerability Assessment and Hardening
- Trade-Off Studies
- Inputs to Survivability Assessments
- Live Fire Testing
- Feedback to Integrated Product Definition

# Vulnerable Component Determination





# Forward Fuselage Damage



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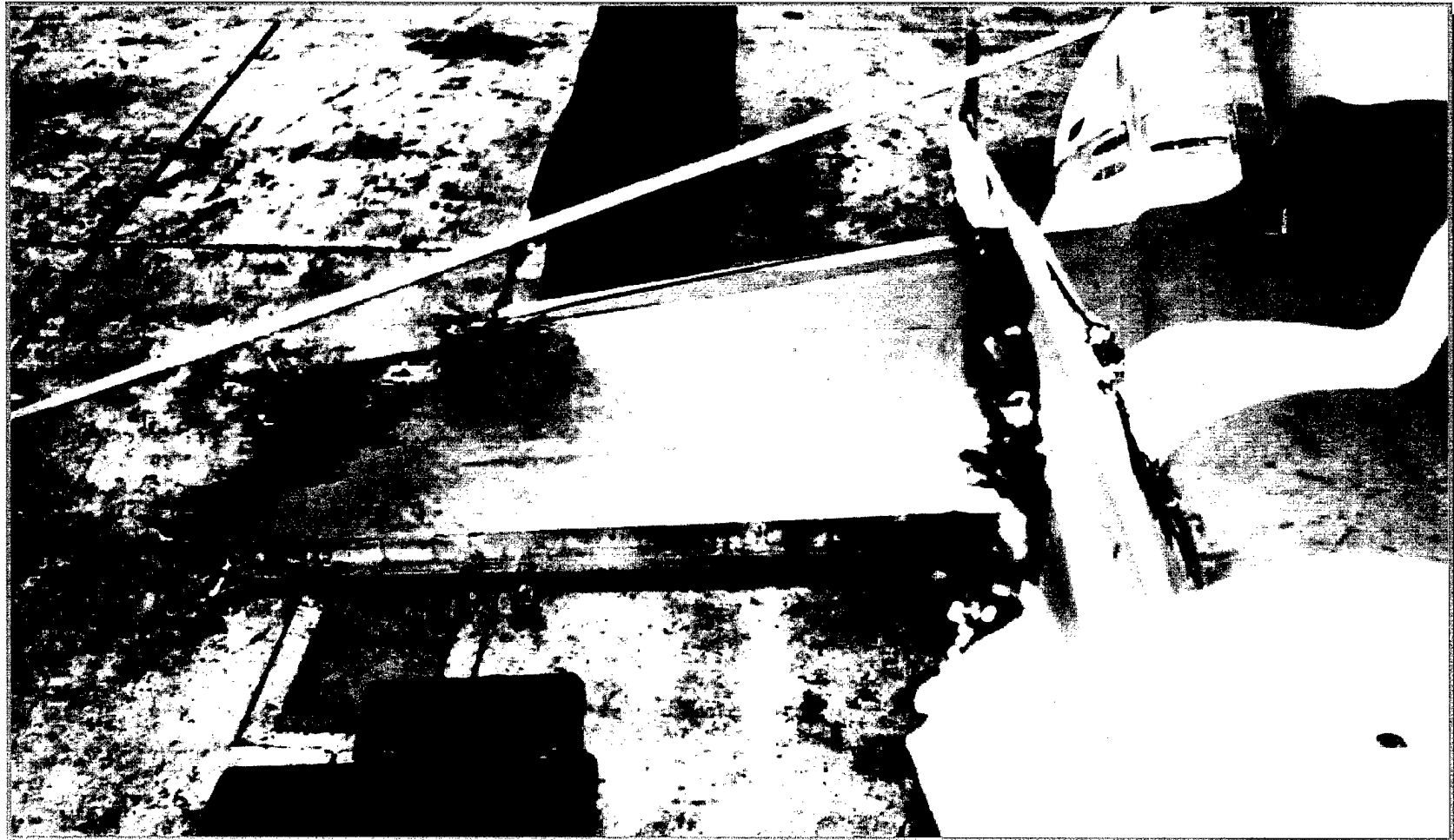
# Forward Fuselage Damage



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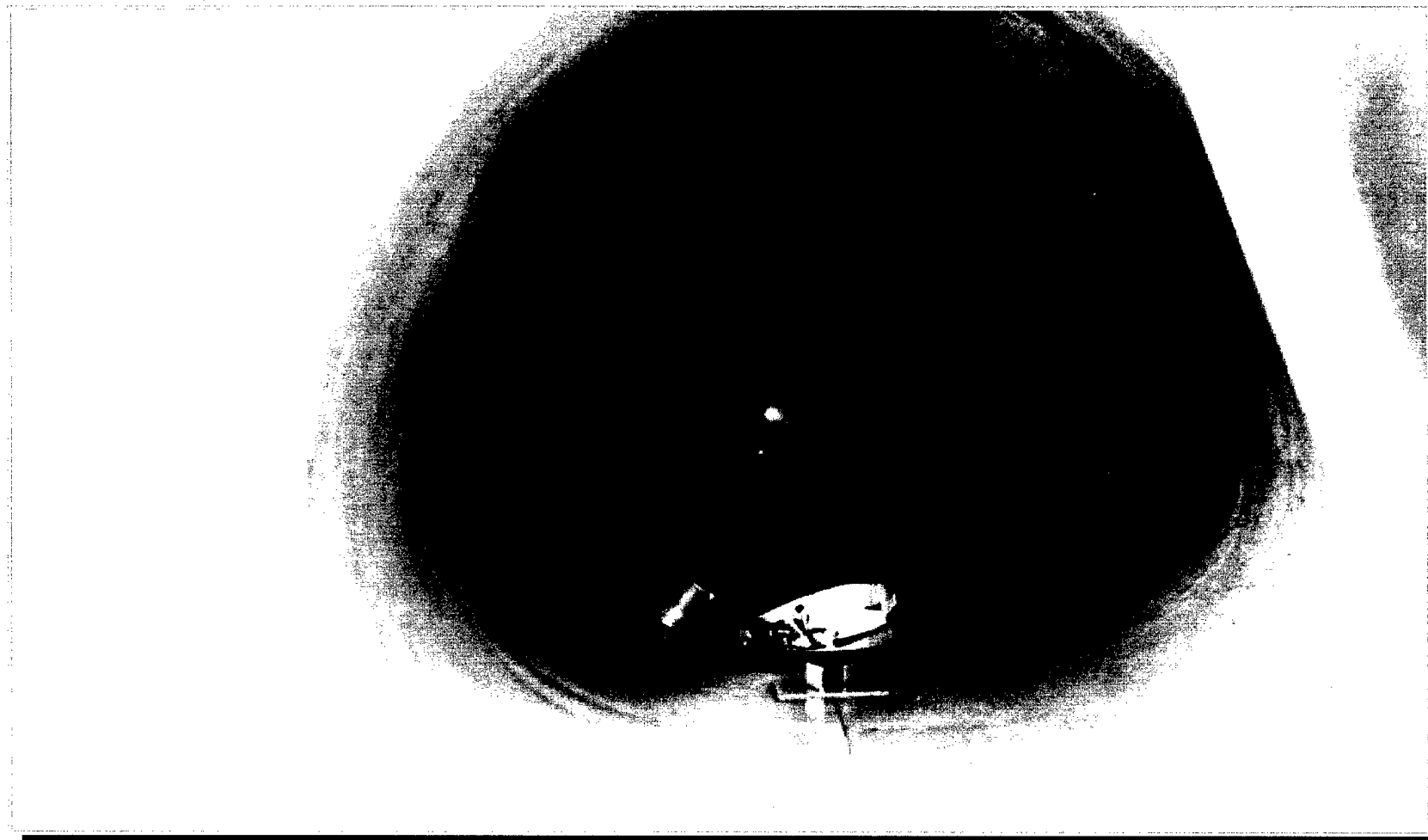
# Wing and Vertical Tail Damage



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# Engine FOD






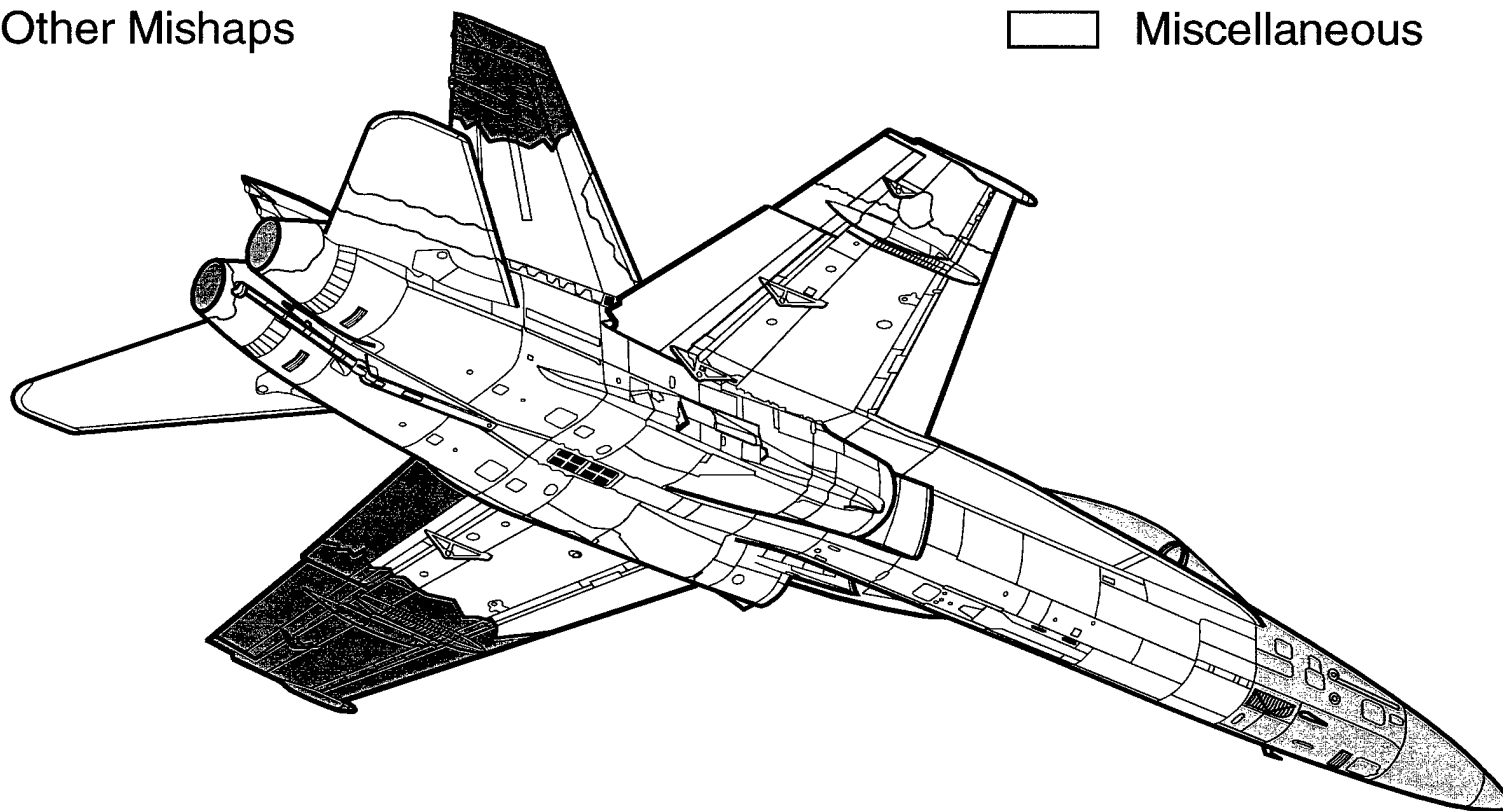
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# In-Flight Lost Surface Areas on Recovered F/A-18s

- Mid-Air
- Other Mishaps

  April 23, 1996 Mid-Air  
 Miscellaneous







# Summary

- Mid-Air Accidents Are Infrequent
- Damage Tolerant Structure and Subsystems Increase the Chances of Surviving Mid-Air Accidents
- Utilization of Operational Accident Data Is Part of the Vulnerability and System Safety Programs for All F/A-18 Aircraft
- The Results Are Not Necessarily Transferable to Non-F/A-18 Aircraft